Abstract

A magnetic anomaly sensing system uses triaxial magnetometer (TM) sensors arranged in a three-dimensional array. A processor coupled to the TM sensors generates partial gradient contraction data, and complete gradient tensor data and corresponding complete gradient contraction data. The generated data can be used to align the three-dimensional array with a magnetic target. Once the three-dimensional array is aligned with the magnetic target, the generated data can be used to uniquely determine (i) distance to the magnetic target, (ii) position of the magnetic target relative to the three-dimensional array, and (iii) the magnetic dipole moment of the magnetic target.